Section 5

Engineering Report

Engineering Report
Resource Recovery Permit

Clean Earth of New Castle, ~~Inc.~~LLC
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1301 DRGSW

Section 4.4.1.4 An engineering report

A Site Plan Drawing showing the complete layout of the facility, process area and equipment is provided as Appendix I of this report and has been prepared and signed by a Professional Engineer registered in the State of Delaware. This report shall include the following;

4.4.1.4.1 A drawing or drawings showing the complete layout of the proposed facility.

Drawing showing the complete layout of the facility is included in Appendix I of the General Operations Plan (see drawing no. SP-01, Facility Site Plan, prepared by ~~Busch Associates~~Compliance Plus Services, Inc. (CPS)).

4.4.1.4.2 Mass and energy balances, including calculations and pertinent facts relating to the development of these balances.

The facility operates a soil remediation unit (SRU) that has the ability to thermally heat soils in a rotary dryer where petroleum hydrocarbons present in the soil materials are desorbed and volatilized into the system's gas (air) flow. The organic hydrocarbon contaminants that are volatilized in the hot gas are directed to an oxidizer unit that operates at a temperature of at least 1500°F. The operating temperature and retention time in the oxidizer is designed to achieve a destruction efficiency of 99.9% of the hydrocarbons present in the system's gas stream. This unit has been subject to multiple stack testing under the auspices of both the Department's Air Quality Division and a independent testing firm that have consistently demonstrated that the SRU can meet this design criteria. The remainder of the facility's operations including the proposed Biological Remediation Soils process consists of only physical mixing and blending processes, as such there are no pertinent calculations pertaining to mass-energy balances.

4.4.1.4.3 Descriptions and specifications of all proposed design features that the engineer has provided to the owner of the facility.

~~No~~The only new equipment ~~is~~ being proposed is the installation of a bulk bag application system, as described in Operating Module 3. The specifications are also provided in Appendix I of Operating Module 3.

4.4.1.4.4 A description of the proposed installation methods and procedures.

The current CENC facility is fully operational with respect to the thermal treatment (soil remediation unit (SRU)) program. Equipment and facilities supporting the Direct Reuse

Soils ("DRS") Program are in place and will be operational after final DNREC approval of the DRS program.

Proposed installation methods and procedures for the facilities associated with the Soil Amendment (NHRM) program are outlined in CENC's General Operations Plan – Non Hazardous Recyclable Materials (NHRM) Processing Systems (last revised June 2003). This Plan was previously submitted and approved by DNREC in prior applications made by CENC.

The BRS process can be implemented following DNREC approval with direct application of the specialized biological treatment reagents to individual treatment batches. The batches will then be mixed or blended with existing mobile equipment. CENC is seeking approval to install bulk bag application equipment at a later date (see Attachment IV of Operating Module 3 for an example diagram of the bulk bag unloading system). All equipment associated with the bulk bag application equipment will be installed and operated in accordance with manufacturers' guidelines. CENC is also planning on repairing Building B to its previously approved condition. Building B was previously removed from service due to a roof failure caused aby a storm event. CENC will hire a third party contractor to perform all repairs and abide by all applicable local building codes.

4.4.1.4.5 A plan for third-party quality assurance for the construction and installation of components of the facility that will be used in the processing, handling, and/or monitoring of solid waste.

The current CENC facility is fully operational with respect to the thermal treatment (soil remediation unit (SRU)) program~~.~~, ~~Equipment~~ and facilities supporting the Direct Reuse Soils ("DRS") Program~~ are in place and will be operational after final DNREC approval of the DRS program.~~

The plan for third-party quality assurance of the construction and installation of the Soil Amendment/NHRM components that will be added to the existing facility is outlined in Section 6.0 of the General Operation Plan – Non Hazardous Recyclable Materials (NHRM) Processing Systems (Rev. 8 last revised May 2010~~June 2003~~). This Plan was previously submitted and approved by DNREC in past applications made by CENC. The BRS process can be implemented with no construction or installation required, however CENC is seeking approval to install bulk bag application equipment and to repair Building B at a later date. The proposed construction and/or ~~and~~ equipment installation will be overseen by a qualified professional engineer to provide a final independent professional engineering certification to document that the construction was completed in accordance with the design requirements. As part of this certification, the PE will conduct onsite inspections and evaluations as he determines necessary to ensure that the quality of construction meets the standards specified by the manufacturer and design engineer. A final certification letter will be submitted to CENC and the Department prior to commencement of operations within any of the management units for the BRS process or Soil Amendment/NHRM Program not currently in place.

4.4.1.4.6 A schedule of events for construction of the facility.

The current CENC facility is fully operational with respect to the thermal treatment (soil remediation unit (SRU)) program. Equipment and facilities supporting the Direct Reuse Soils ("DRS") Program are in place and ~~will be~~ operational. ~~after final DNREC approval of the DRS program.~~

The schedule of events for the construction of the various phases of the NHRM operation has been outlined in Section 6.0 of the General Operations Plan for Non Hazardous Recyclable Materials Processing Systems.

The construction schedule for the BRS soils process has been outlined in Section 4 of Operating Module 3.

4.4.1.4.7 Proposed design capacity per day, and life expectancy of the facility.

The CENC facility has the following design capacities:

SRU: 60 Tons/hour (6,000 hours/year)
(Operations are permitted 24 hours/day, 7 days/week)

Soil Amendment (NHRM) Program:

Solids: 3600 tons/day (maximum throughput) based on the maximum throughput capacity of the feed hopper and conveyor system. The operational capacity for the Solid NHRM, based on a maximum mixture ratio with the treated soils of 1:1, is 1440 tons per day.

Semi-Solids: 600 tons per day (maximum throughput)
(Note: the 600 ton/day semi-solid NHRM throughput capacity will supplant solid NHRM capability when these process throughput capacities are based on the 24 hour maximum operating hours of the plant).

Water Bound: 80,000 gallons/day (maximum throughput based on the existing data of daily potable water usage of the SRU, assuming that the water bound waste supplement the use of the potable waters and include the proposed tank storage capacities)

DRS Soil Program: 3,000 tons per day
Detailed design capacity of the various operations (SRU, NHRM and DRS) at the facility are discussed in the General Operations Plans submitted in the facility's permit renewal application.

Storage capacities:
TPH Soils: 16,000 tons in Building A, B and C
6,000 tons in the Quonset Hut (Building D)
Soil Amendment Progam

Solids: 3000 tons
Semi-Solids: 200 tons
Water Bound: 36,00 gallons

DRS Soil Program:	DRS Receiving Area	500 tons
	DRS Stockpile Area 1 & 2	5,000 tons each 10,000 tons combined

Life expectancy of the facilities at CENC is at least twenty-five years under normal process wear.

4.4.1.4.8 A description of potential safety hazards and methods of control.

All processing systems will be operated in accordance with the facility's existing health and safety policies and procedures. These procedures cover a myriad of OSHA-required training and safety programs (e.g., lockout/tagout, fall protection, confined space, proper use of personal protective equipment, hazard communication standards, etc.) to ensure that all operations conducted at CENC meet both federal and state specific-guidelines and standards for industry safety. Routine safety walk-throughs are conducted by facility personnel to ensure company safety policies and procedures are adhered to.

The current CENC facility is fully operational with respect to the thermal treatment (soil remediation unit (SRU)~~)~~ program~~.~~, and the ~~E~~equipment and facilities supporting the Direct Reuse Soils ("DRS") Program are in place and ~~will be~~ operational. ~~after final DNREC approval of the DRS program.~~

The additional NHRM operations will result in minor changes to the traffic patterns currently utilized by the facility. These will be generally limited to the traffic associated with the delivery of liquid and semi-solid NHRM's to the newly added storage units. The storage units associated with the NHRM operations are only expected to receive a maximum of 20 to 40 trucks per day based on the maximum design throughput of these units. Consequently, compared to the 200 trucks that may be received and shipped out at the facility daily, this number of vehicles is not a significant increase in the traffic that warrants additional controls other than those already in use.

The types of wastes that will be managed under the NHRM operations generally do not present an increase in the safety or health concerns at this facility. The current operations include the management of contaminated soils that may have high levels of petroleum hydrocarbons that have higher vapor pressures and present a higher health risk than the proposed NHRM operations. The only additional risk that was not previously associated with the CENC facility is the storage of liquid wastes. However, these wastes are water-bearing wastes will very low levels of organic contaminants that present low exposure risk to human health and no fire/explosion risk. The facilities related to the NHRM operations include adequate secondary containment to contain potential leaks or spills

associated with these operations. Consequently, there is little, if any, risk associated with these operations other than what has been previously addressed.

The proposed BRS soil processing operations as described in Operating Module 3 will require pre-treatment storage, screening and post-treatment storage and turning during the biological treatment process.

Similar processes are employed in the current thermal treatment soil remediation unit (SRU), these operations have been in place and fully operational for many years. Therefore, potential safety hazards and associate methods of control are well established and there is very little or no additional risks associated with the BRS.

CENC does anticipate the future installation of a bulk bag application system for biological treatment agents. This unit once approved by DNREC and scheduled by CENC, will be installed and operated in accordance with the manufacturer's recommendations, minimizing the associated risks.

4.4.1.4.9 An analysis of the concept of the facility's expansion at a later date, if and when deemed necessary by the Department.

No further expansion of the facility is proposed at this time other than the specific operations addressed in this submission.

4.4.1.4.10 An identification of possible ground water and surface water discharges.

The proposed operations will not change the existing groundwater and surface water engineering controls already in place at this facility. No new surface of groundwater discharges will be associated with the modification proposed.